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Mandatory GMO Labeling?

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GENETICALLY ENGINEERED (GE) crop varieties have been prominent in US agriculture for many years. First commercialized in the 1990s, they were rapidly adopted by farmers. By 2014, 93 percent of corn and 94 percent of soybean acres were planted with these varieties. Favorable reception of these products was never universal, as objections were voiced by some segments of the public; however, it seems fair to say that the acceptance of this new technology was smoother in the United States than elsewhere. This conclusion has been tested over the last few years by an increased public awareness and activism intended to bring about new legislative action on genetically modified organisms (GMOs), as GE products are often called. Such efforts have specifically aimed to introduce state-level requirements for mandatory food labeling of GMO content. Proposition 37, put to California voters in 2012, squarely aimed at mandating such labeling. Although defeated at the polls, it brought much publicity to this issue. Similar initiatives were also narrowly defeated in the states of Washington (2013) and Colorado and Oregon (2014). However, Vermont enacted mandatory GMO labeling legislation in 2014, and Maine and Connecticut have approved bills that would trigger such labeling under certain conditions (related to neighboring states also mandating GMO labeling), and several other states are considering similar actions. Are we witnessing the dawn of mandatory GMO labeling in the United States, and would that be a desirable outcome?

Proponents of mandatory GMO labeling articulate a number of justifications, starting with the view that consumers have a "right to know." Consumers, it seems, agree. An Associated Press-GfK poll carried out in December 2014 found that 66 percent of the public favors requiring food manufacturers to label products that contain GMO ingredients, with only 7 percent of Americans opposing the concept. What could be wrong with the right-to-know rationale in this setting? After all, we live in an information age, and we are getting used to having instant access—with our computers, tablets, or smartphones—to an amount of information that was unfathomable only a few years ago.

It helps to start by asking why one might want to provide this information. The general presumption, of course, is that more information is better, and more information should help consumers make better choices. Support for mandatory labeling then hinges on the belief that information concerning GMO content is relevant to consumers because the health safety of these products has not been conclusively proven (related concerns may refer to the environmental impacts of GMOs and/or ethical objections to products perceived to be unnatural). The facts, however, are not in agreement with this perspective. GE products have been widely studied in the process of being approved for cultivation and marketing. Extensive data concerning biotech corn, soybean, wheat, potato, rice, sugar beets, papaya and many other products, have been reviewed by the FDA for two decades and the conclusion has invariably been that products from GE varieties are substantially equivalent to their traditional counterparts. In particular, there is no science-based reason to presume that the products containing GMOs marketed to date are less healthy for consumers. This general conclusion has been reached independently by the review process in many other countries. The need to alert consumers of potential health risks is just not there, it seems.

Note that the foregoing discussion has changed the spotlight from the right to know to the "need to know." Why not ignore the latter and require GMO labeling simply because it appears that many consumers favor the notion? At least two observations are germane

continued on page 10

USDA/Photo by Scott Bauer

Nitrogen Management under Uncertainty continued from page 6

function about how yield responds to nitrogen. The survey responses were then used to develop a structural model of farmer-level nitrogen management decision-making.

Studies by psychologists and behavioral economists almost invariably find that people are overconfident. A form of overconfidence relevant to agricultural production is unrealistic optimism—the belief that really good outcomes (e.g., exceptional yields) will occur despite objective evidence to the contrary. Our survey does not indicate overconfidence is prevalent among the central Iowa farmers surveyed. However, we do find some evidence of unrealistic optimism regarding yield expectations among a subset of the farmers we surveyed. A roughly equal-sized group of respondents are pessimistic about yield expectations, that is, they expect lower yields than those estimated by independent data sources. On average, the farmers we surveyed expect to harvest only slightly more bushels per acre than is predicted by historical data.

Preliminary analysis suggests that farmers overstate the impact nitrogen has on corn yields. Using data from Iowa State research farms, which have been used to study the role of nitrogen on corn yields for decades, we estimate the actual impact of an increase in nitrogen on average yield. Our survey asked farmers their perceptions about the yield response to added nitrogen on the fields that they managed, and the results show farmers believe that the decline in expected yield due to a nitrogen reduction is generally larger than the rise in expected yield due to a similar increase in nitrogen applied.

A crucial question we seek to answer is, do farmers' subjective beliefs about nitrogen-corn yield relationships match the objective data or the agronomic models and advice that they receive? Our preliminary findings suggest the answer to this question is no. For approximately 30 percent of the farmers in our survey, the expected incremental increase in yield from an increase in nitrogen applied exceeds the objective estimate that was attained from the research farm data.

Implications for managing nitrogen

In summary, the early indication is that there may exist stark differences between farmers' subjective beliefs about nitrogen's effect on yield and the assumed relationships that underlie current nitrogen recommendation systems.

For example, we find that farmers may perceive yield and profit gains from added nitrogen that simply do not exist based on past data. If our results hold, this finding could have important implications for designing policies to manage nutrients. For example, perhaps an effective first policy step toward improving water quality is to provide farmers with better information about the impacts of nitrogen on yields and on their bottom line. More generally, understanding the fertilizer-yield relationship as perceived by producers can help inform nutrient policy design and also the extension services provided to producers. As state leaders, farmers, and other stakeholders begin to address the issues surrounding nutrient management and reductions of agricultural runoff, having a clear understanding of the decision processes used by producers will be key. Evidence-based policymaking needs to take into account the behavior and attitude of farmers to be effective, and designing policies without such information could result in policy that is not only inefficient but also ineffective. ■

Mandatory GMO Labeling? continued from page 7

at this juncture. First, new label information would inevitably crowd other facts and claims already present, thereby competing for limited consumer attention. Consumers inevitably deal with information overload in many ways, including rule-of-thumb decision processes. If they are accustomed to seeing mandatory disclosures only when their need is unquestionable (e.g., tobacco packaging warning messages), consumers may rationally infer that if a GMO label is required it must be because these products are objectively risky. In other words, a mandatory GMO label may end up stigmatizing products carrying it, regardless of the objective truth, and turn off consumers. Somewhat paradoxically, precisely because GE products remain somewhat controversial despite the ample scientific evidence, the need-to-know perspective is of paramount importance vis-à-vis the right-to-know argument.

Other economic considerations are also in order. Mandatory GMO labeling would be costly to society. Such costs take a number of forms. Food manufacturers, conscious of the stigma of GMO labeling, might reformulate many of their products, substituting GE ingredients with less desirable yet non-GMO alternatives (e.g., palm oil instead of soybean oil). This costly process would be exacerbated if GMO labeling were mandated by some states and not others, requiring the food system to implement identity preservation and segregation activities currently unnecessary. Such costs could add up to nontrivial amounts. A University of California study in 2012 concluded that Proposition 37 could have increased food manufacturing costs by more than

$1 billion per year. Not surprisingly, strong objections to such mandatory labeling have been registered in the food industry (the Grocery Manufacturers Association, along with other industry groups, promptly filed suit in June 2014 against Vermont's new GMO labeling requirements).

So, should the non-GMO preferences of some consumers be ignored? Not necessarily. The alternative to mandatory GMO labeling is voluntary labeling of a product's non-GMO status. Indeed, consumers who wish to avoid GE ingredients in their food already have the ability to do so by purchasing certified organic food or food products manufactured without GE ingredients (as certified by third-party organizations such as the Non-GMO Project). Voluntary labeling of such attributes has the virtue of being incentive-compatible: the higher costs of non-GMO food is paid by the consumers who actually elect to avoid GE products. Furthermore, voluntary labeling is consistent with the long-standing philosophy of FDA regulation concerning food labels. Indeed, the prevailing legal perspective is that federal law preempts state law in these matters. About twenty years ago federal courts overturned the Vermont mandatory labeling of milk produced with recombinant bovine somatotropin, arguably a close precedent to the current GMO labeling issue.

The unnecessary costs of implementing mandatory GMO labeling, noted earlier, underscores the emphasis on efficiency dear to economics. In this context, a subtler "dynamic efficiency" notion is worth pondering as well. This relates to the flow of new technologies and products that results from sustained investment in research and development activities. Mandatory GMO labeling in the absence of a science-based reason to do so could stigmatize these products and drive investments away from the development of new GE products. Companies that are committed to biotechnology innovations in agriculture, such as Monsanto and other agro-biotech firms, are understandably worried about the prospect of mandatory GMO labeling, and have spent heavily to publicly oppose state ballot initiatives over the last few years. But it should be clear that society at large has a stake in this innovation process. As we confront the food security challenges of a world faced with a major population increase, limited natural resources, and climate change, it is imperative that the potential contribution of scientific research and new technologies be exploited to its fullest impact.

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In the end, the debate about mandatory GMO labeling rekindles questions about the appropriate regulation of new products and new technologies. The experience of the European Union (EU) with GE innovation in agriculture provides a sobering reminder of the destructive power of questionable regulations. Whereas the EU-wide risk assessment of GE products by the European Food Safety Authority (EFSA) typically reaches the same conclusions as its US counterpart, adoption of GE varieties in the EU is hampered by a general political unwillingness to follow EFSA's science-based findings, and by other EU and member-state policies (including mandatory GMO labeling and coexistence measures) that make farmers' adoption of GE varieties all but impossible. The end result: in 2014, 180 million acres of land were planted to GE varieties in the United States, whereas only 0.25 million acres with GE varieties were planted in the entire EU.

Protecting the public from new risks remains a paramount objective of public regulation. This is why new GE varieties undergo extensive review as part of their pre-market authorization, with specific roles for the USDA, EPA, and the FDA. This process is, and arguably must remain, science-based. Once new GE varieties are approved, post-market regulations such as mandatory labeling have a doubtful role, and may serve little purpose beyond impeding the adoption of new, efficiency-enhancing technologies and new products. ■